

University of Groningen

Rediscovering Clusius.

van Berkel, K.

Published in:

Bijdragen en Mededelingen betreffende de Geschiedenis der Nederlanden

DOI:

[10.18352/bmgn-lchr.6786](https://doi.org/10.18352/bmgn-lchr.6786)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2008

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

van Berkel, K. (2008). Rediscovering Clusius. How Dutch commerce contributed to the emergence of modern science. *Bijdragen en Mededelingen betreffende de Geschiedenis der Nederlanden*, 123(2), 227 - 236. <https://doi.org/10.18352/bmgn-lchr.6786>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Rediscovering Clusius. How Dutch Commerce Contributed to the Emergence of Modern Science¹

KLAAS VAN BERKEL

Cook, H. J., *Matters of Exchange. Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven, London: Yale University Press, 2007, xiv + 562 blz., ISBN 978 0 300 11796 7 (cloth)).

Twenty years ago, aside from a handful of specialists in the history of biology, almost nobody knew who Carolus Clusius (1526-1609) was. At most, people knew him to be a botanist from the Southern Netherlands who in 1593, after many travels in Europe, was brought to Leiden to add lustre to the teaching of botany. Although his name appeared in surveys of the history of the natural sciences in the Netherlands, he has never been accorded much attention. There was no article on him in the biographical anthology *Van Stevin tot Lorentz* (1980), long regarded as representing the canon of Dutch history of science, nor does he feature in the biographical section of the more recent, broadly conceived standard work, *A History of Science in The Netherlands* (1999), even though one of the editors was a biologist. Since then, however, he has been rediscovered and his star is rapidly on the rise. Eric Jorink's *Wetenschap en wereldbeeld in de Gouden Eeuw* (also published in 1999) placed a more than routine emphasis on the botanist, and this was just the beginning.² The year 2004 saw the launch of the Clusius project in Leiden, with a senior researcher and two PhD students studying Clusius's paper legacy in the Leiden University library and reconstructing his network. The first volume on Clusius and his network has already appeared.³ But Clusius has become a figure of significance outside this project as well. In the recent *Tulipmania*, Anne Goldgar's fascinating study on the 1637 tulip frenzy (a book about much more than just the trade in tulip bulbs), nobody rates as many

¹ Translation: University Translation and Correction Service, University of Groningen.

² A.J. Kox, M. Chamalaun (eds.), *Van Stevin tot Lorentz. Portretten van Nederlandse natuurwetenschappers* [From Stevin to Lorentz. Portraits of Dutch scientists] (Amsterdam 1980; reprinted 1990); Klaas van Berkel, Albert van Helden, Lodewijk Palm (eds.), *A History of Science in the Netherlands. Survey, Themes, and Reference* (Leiden 1999); Eric Jorink, *Wetenschap en wereldbeeld in de Gouden Eeuw* [Science and Worldview in the Golden Age] (Hilversum 1999).

³ Florike Egmond, Paul Hoftijzer, Rob Visser (eds.), *Carolus Clusius in a New Context. Cultural Histories of the Renaissance Natural Science* (Amsterdam 2006). See: www.bibliotheek.leidenuniv.nl/docenten_onderzoekers/scaliger_instituut/clusius/jsp.

mentions as Clusius. This is of course hardly surprising, given the vital role he played introducing the tulip into Dutch gardens.⁴

In *Matters of Exchange* Harold Cook, Director of the Wellcome Trust Centre for the History of Medicine (University College London), goes one step further. He takes Clusius out of the context of botanical science and assigns him a prominent place in the general history of sixteenth and seventeenth-century science. For Cook, Clusius is above all a master of the exact description of living nature and hence a key figure in the birth of the new science. He was not the only one of course. 'A variety of people who advocated what came to be called the new natural philosophy held that wide experience, linguistic skills, a good memory, a clear head, and the cultivation of virtue, when coupled with exhaustive and sometimes exhausting investigations of things themselves, led to real and solid knowledge of nature' (104). His work was paradigmatic, however. And it was new, although not in the traditional sense:

The values represented in Clusius's work [...] originated not from a change in worldview so much as from paying close attention to the things of the world, which were in turn associated with the worlds of commerce and liberty.

Like many others, Clusius was not concerned with discovering general principles, but with knowing about things themselves, with knowledge of particulars. This is what places him at the origins of what Cook elsewhere describes simply as 'the new science' (131).

The path that Clusius has taken in the historiography of science – from footnote to exemplar – is of course symptomatic of shifting emphases in the history of science. Whereas the chief preoccupation had long been with key scientific discoveries or the formulation of new insights into the nature and structure of the physical world, more recently the more general scientific culture in which these intellectual developments occurred has moved to centre stage. Attention has shifted from brilliant individual thinkers to the countless assistants, lesser contributors, and wealthy patrons, the humble draughtsmen and lens grinders no less than the princes and prelates, who not only made scientific work possible, but whose practices gave rise to norms and values that constituted what we now call science. The history of science is no longer, or not simply, a history of ideas; science is also studied as the sum total of specific practices out of which science emerges. As a result, the assumption that astronomy, mechanics and optics constituted the core of the Scientific Revolution in the seventeenth century has been replaced by a more ecumenical approach that accords at least equal status to medicine, natural history and alchemy. One of the victims of these shifts has been the old notion of the Scientific Revolution itself. These days we no longer take for granted that the history of early modern science coincides with the development of astronomy and the physical and mathematical sciences from Copernicus to Newton. One

⁴ Anne Goldgar, *Tulipmania. Money, Honor, and Knowledge in the Dutch Golden Age* (Chicago 2007).

of those to clearly benefit from this shift is Clusius. Although he did not make any great discoveries or design any new systems, thanks to his vast correspondence, his painstaking study of individual plants and his authoritative botanical collections, he helped lay the foundations for a thriving scientific culture in Europe.

The appearance of *Matters of Exchange* – in which Cook takes Clusius out of the world of botany and gives him a pre-eminent position in the general history of science – marks a milestone in the history of science as an academic discipline, a fact which critics have been quick to recognize. ‘It deserves to become a modern classic’, wrote Wijnand Mijnhardt in a laudatory review for the journal *Isis*.⁵ I fully endorse this, provided that I don’t have to agree with all of Cook’s arguments. For I believe that the final word is yet to be said on some of the key issues raised by Cook.

Despite the strong narrative quality of *Matters of Exchange*, which seems at times to want to survey the whole of scientific practice in the seventeenth-century Republic, it is essentially a book-with-a-thesis. This thesis is formulated most clearly on page 40: ‘The intellectual activities we call science emerged from the ways of knowing valued most highly by the merchant-rulers of urban Europe’.⁶ It was merchants in the large cities of southern and western Europe who not only made the new science materially and financially possible, but who also shaped its direction, which distinguished it from the old science taught at the universities.⁷ Merchants, and certainly those engaged in overseas

⁵ Wijnand Mijnhardt, ‘Dutch Commerce and the Origins of Modern Science’, *Isis* 98 (2007) 808–812, 812.

⁶ The crucial word here is ‘emerged’. It indicates that for Cook the emergence of modern science is an unintended consequence of certain practices and that what emerges from a whole complex of operations is only subsequently articulated as ‘science’. It is a view of historical causality that differs somewhat from the older history of ideas, in which it is ideas that lead to actions. The word ‘emergence’ is of the same order as ‘unintentional’ and ‘impersonal’; it is primarily a matter of behaviour and suggests a movement from below, from scientific practice. Ideas, on the other hand, relate to thought, which is always conscious and personal and which is, as it were, imposed on practice from above.

⁷ The close relationship between commerce and science has already been discussed in: Pamela H. Smith and Paula Findlen (eds.), *Merchants and Marvels. Commerce, Science and Art in Early Modern Europe* (New York, London 2002). This volume results in part from a conference in 1999 in the Clark Library in Los Angeles, to which Cook also contributed. The editors contend in their introduction that the patronage system and commerce ‘greatly encouraged the investigation of and familiarity with nature’. These two social and economic systems boosted the status of those who claimed to be experts in the accurate representation of nature, such as artists, medical practitioners and craftsmen. ‘This volume argues that these individuals helped lay the foundations of the new philosophy, which eventually would come to be called “science”. This new natural philosophy, pursued with increasing enthusiasm in the late sixteenth and seventeenth centuries, emphasized practice, the active collection of experience, and the observation of nature’. Greater attention to patronage and commerce would lead to a reconsideration of ‘the conventional story of the Scientific Revolution’ (3).

trade with the East and West Indies, attached great importance to the accurate description and identification of the commodities they traded in – what exactly were they buying, what was it worth, and what was it made of? Exactly the same questions were being asked by botanists, physicians, apothecaries and other practitioners of natural history. Their main concern was to know about individual plants, animals and objects, rather than understand the first principles on which the tangible world is based. For them, science was first and foremost a matter of knowing the facts, not the causes (Cook sees here a distinction between *kennen* and *weten*, knowing by acquaintance rather than by reasoning). The new science was chiefly descriptive, not analytical; it was based on experience, accurate description and broad observation, precisely the intellectual values that flourished in merchant circles and among those connected with their world (including the princes who strove to promote the material interests of their kingdom).

The affinity between the worlds of trade and science went even further. The vast supply of ever new and fascinating objects from all over the world fuelled certain passions that had previously had a suspect or inferior status. In this new world of constantly novel commodities, curiosity and a desire for collecting things acquired a new positive value, thereby giving the passions themselves a more positive significance than had formerly been the case. Commerce taught that people were driven not by reason, but by passion, and this was also recognized in science. Reason was insufficient for learning about the world; knowledge relied on passion and desire, on an almost physical need for direct contact with the world. Religious precepts or moral stipulations didn't enter into it; all that mattered to natural philosophers was the material object. This gave the new science – almost inherently – a materialistic, or at any rate non-metaphysical, quality. Natural philosophers were like the merchants, who were also not interested in all manner of abstract reflections and theoretical exercises.

Now, if the link between commerce and science was going to be evident anywhere, it would have been in the young Dutch Republic. Although world trade was not invented in the Netherlands, it flourished here on an unprecedented scale, and those who controlled the Dutch East India Company and West Indies Company also commanded the ship of state. This is why Cook chose to expand on his general thesis in terms of the history of science in the Netherlands – if his thesis was valid, this would be demonstrated in the Republic.

In its own way, each chapter provides support for this thesis. After two introductory chapters that explain the thesis and set the scene (the Republic), Cook addresses in essentially chronological order the new natural history as practised by Clusius, the relationship between commerce and science in the Amsterdam of physician Nicolaas Tulp, Jacobus Bontius's search for tropical medicines, Descartes's philosophy of the passions, the new preparation techniques derived from the world of commerce and the trades, Van Reede tot Drakenstein's natural history collections in the tropics, Ten Rhijne's transfer of Western medicine to the Japanese, and the refusal to speculate about the deeper

causes of nature that left such a stamp on the life work of Herman Boerhaave. The book closes with a short chapter on 'Conclusions and Comparisons'.

A brief summary of the book's contents can hardly do justice to the wealth of description and the subtle reasoning that Cook exhibits in his argument. While reading there were moments when I believed I was experiencing the wonder that people in the seventeenth century must have felt when encountering yet another new natural product or artefact from the tropics. Cook succeeds admirably in communicating to his readers the early modern fascination for empirical knowledge. And the reader soon gets the feeling that this is a more realistic portrayal of the development of modern science than he meets in the books that analyse the abstract notions of a particular natural philosopher. Cook makes it clear that barely literate craftsmen are also part of the history of modern science. It is out of their working practices that gradually evolved the attitudes, norms and values which, once articulated as such, later went on to form the foundations of modern science. The reader must simply tolerate Cook's tendency to use more words than are necessary. There are digressions that we could have done without. I see no reason why the account of Clusius's life should include almost an entire page on the chambers of rhetoric (85). In general, however, it is true that only something like a 'thick description' of the seventeenth-century world of science can clearly make the points that Cook wishes to convey. Recounting is, after all, also a kind of argument.

A narrative line of argument also has its risks, however, and Cook has not escaped entirely unscathed. He is rather careless on occasions in his use of critical terms. For example, what is this new science whose emergence he discusses? The book's subtitle refers to both medicine and science as if they are two separate entities, but in the very first note he explains, rather too laconically in my view, that he is aware that 'science' is an anachronistic term, and one that he will use 'as a shorthand for "natural knowledge", which encompasses such subjects as natural philosophy, natural history, medicine, and technology' (417). Here medicine is part of science. Despite his assurance that he knows the term 'science' to be an anachronism, Cook appears to be adhering to what Pickstone recently called the 'singular science model'.⁸ In brief, this is the notion that, together, all the ways in which knowledge about nature was acquired in the early modern period nevertheless made up something coherent like 'science'. Yet we have long been aware that this idea was the brainchild of a few nineteenth-century science lobbyists who then projected it back onto the early modern period. Cook refers regularly to 'the' new science, although the examples that he mentions are only taken from medicine and natural history. Optics, mechanics, astronomy, alchemy and geography barely rate a mention, if at all. Is this neglect of certain disciplines unimportant because the same story could be told for those disciplines (which

⁸ John V. Pickstone, 'Working Knowledges before and after circa 1800. Practices and Disciplines in the History of Science, Technology, and Medicine', *Isis* 98 (2007) 489-516 (490).

is unlikely in the case of, say, mechanics) or does Cook view them as insignificant in seventeenth-century science as a whole?

Cook mystifies me on this point. He must have realized that by only discussing those developments that suited him and simply ignoring others, his argument would come across as rather selective. Why didn't he anticipate this rather obvious objection? And why did he not devote a little more attention to alternative sources for the new science as recently revealed by historians of science? Although he does mention and quote both Bruce T. Moran, who points out the same approach in the sixteenth-century practice of alchemy at German royal courts that Cook sees as being so characteristic of seventeenth-century merchants in the Republic – namely the study of nature based on experience and experimentation – and Pamela Smith, who identifies the same characteristics of modern science in the panels of late medieval Flemish painters and the drawings of sixteenth-century German artists, he completely seems to overlook the fact that their books undermine his thesis that it was in particular the worldwide economic network of the Dutch regents which gave rise to something new. He also assumes all too readily that the Dutch Republic can be completely identified with the merchant class, as if industry played a negligible part in the Republic's economy. And finally, he almost completely ignores the importance of university scholarship; it was precisely in the Republic that this flourished. Although the merchants and regents may have paraded in their lifestyle an outlook befitting practitioners of natural history, they nevertheless sent their sons to study at the bastions of old science, which were in fact far less old-fashioned than we have long believed them to be. Mathematics was practised in the universities at a high level – not exactly the kind of science that fits within Cook's thesis.

What also surprises me is that, whereas the new natural philosophers are discussed at length, the merchants from whom they took their cue are discussed only in general and abstract terms. The merchant that Cook presents is at best an ideal representative of his class, a sociological reconstruction of how a merchant must have done business in order to obtain maximum profit from his enterprise. The fact that merchants, including those in the Republic, sometimes behaved very differently to what their reconstructed ideal type would have us believe does not fit within Cook's story. He only seldom sketches the activities of actual, real-life merchants. Why does he say nothing about Nicolaes Witsen, who was at one and same time director of the Dutch East India Company, mayor of Amsterdam and an ardent collector of knowledge of all kinds?⁹ Witsen was not particularly modern – in any sense of the word – either as a merchant or natural philosopher, but was he an exception or did he represent the rule? A comprehensive argument would discuss such counterexamples, but they are absent here. And why does such a thick book allocate no space to someone like Willem Jansz. Blaeu, who was

⁹ The wondrous world of Nicolaes Witsen as a collector and cartographer has recently been revealed to us in Marion Peters' PhD dissertation, *'Mercator sapiens' (De wijze koopman). Het wereldwijde onderzoek van Nicolaes Witsen (1641-1717), burgemeester en VOC-bewindhebber van Amsterdam* (Groningen 2008).

both a printer/publisher and therefore an entrepreneur (a dealer in books) and a mathematician and astronomer, and who consorted on an equal footing with professional astronomers and mathematicians? No other figure could have better demonstrated the almost intimate link between science and commerce.¹⁰

Instead, one of the few direct sources Cook selects to demonstrate this close association is clearly misrepresented. I refer to *Mercator sapiens*, the famous inaugural address, often quoted and generally poorly understood, delivered by Caspar Barlaeus to the Athenaeum Illustre in Amsterdam in 1632. I find it astonishing that Cook regards it as a key text that proves ‘that the values inherent in the world of commerce were explicitly and self-consciously recognized to be at the root of the new science by contemporaries’ (68). A close reading of the address reveals that Barlaeus is talking about something other than what Cook appears to be suggesting.

In his oration, Barlaeus discusses the close link between commerce, science and philosophy. He says that there is no need for philosophers to shun the big city and no reason at all for them to choose the quiet contemplative life above active involvement in the busy transactions of the city. So far Cook appears to have got it right: the active life of a merchant should also be the philosopher’s ideal. But that is as far as he can take this speech, as Barlaeus goes on to say that it is not the world of commerce that sets the standard for science, but rather science and philosophy that hold up an ideal to merchants. Barlaeus is referring here in particular to the benefits that a merchant can gain from reading the moral philosophers of classical antiquity. Classical wisdom tempers desire, teaching the merchant caution and the need to deal virtuously with the treasures he has acquired. He can also derive immediate benefit from what Barlaeus calls the ‘*philosophia speculativa*’, which for him includes diverse sciences such as geography, astronomy, natural history, meteorology, philology and the study of other peoples. He is not referring here to contemporary practitioners of these sciences like Mercator, Copernicus, Clusius or Ubbo Emmius, but to classical authors like Aristotle, Theophrastus, Pliny and Dioscorides. Barlaeus does not say a word about ‘the new science’, about carrying out research and experiments oneself. He refers merchants and regents to *texts*, texts from a distant past that still had considerable authority. He does not urge his audience to send people off to observe and describe nature with their own eyes, but advises them, once their work is done, to withdraw to the library and to pick up a book.¹¹ This advice was not completely absurd, but what does it have to do with Cook’s ‘new science’? Cook certainly cannot derive an argument from Barlaeus’s oration for his central thesis. It is beyond dispute that the regents of Amsterdam did what was required for the practice of medicine and natural history, such as setting up an anatomical theatre where Nicolaas Tulp could carry out dissections and bringing together collections of

¹⁰ Djoeke van Netten is working on a PhD dissertation on Blaeu that focuses on this aspect.

¹¹ Caspar Barlaeus, *Mercator Sapiens. Oratie gehouden bij de inwijding van de Illustre school te Amsterdam op 9 januari 1632*. With a Dutch translation and introduction published by Dr S. van der Woude (Amsterdam 1967). Cook is referring to Catherine Secretan’s French translation of Barlaeus’s oration, *Marchand Philosophe*.

natural objects in their cabinets of curiosity, in their gardens outside the city gates or at their country houses on the River Vecht. But ancient philosophy and mathematical sciences like astronomy, optics and navigation still had top ranking among the disciplines taught at their own Athenaeum. Why else was the third professor to be appointed – after the philologist Vossius and the poet-philosopher Barlaeus – the mathematician Hortensius, who taught optics and astronomy and who did his best to persuade his superiors to bring Galileo Galilei, under house arrest in his own country, to Amsterdam?

It is not my contention that the idea of a relationship between science and commerce lacks all foundation. Cook comes up with many examples to demonstrate a structural correspondence between the ‘ways of knowing’ of the merchant and the man of science. Not all arguments are equally convincing, however. Nor do I know whether the thesis holds for all kinds of research into natural phenomena. How do famous figures such as Simon Stevin, Isaac Beeckman and Christiaan Huygens fit into this argument?¹² Stevin, a mathematician, bookkeeper and mill designer, takes us into the world of military and civil engineering, Beeckman came from the world of industry (and thought like a craftsman), and throughout his life Huygens moved in the refined world of the aristocracy – which did not of course altogether rule out close contact with clockmakers and ships’ captains. Cook seems to find their world and their science relatively unimportant. ‘Medicine and natural history clearly emerged as the big science of the early modern period’, he states at the start of the concluding chapter (410). But why should this be so? Because those are the fields in which most natural philosophers were working? Or because that was where the most important intellectual breakthroughs occurred? The former is certainly the case; the latter most assuredly not. The type of work being done in natural history and medicine did indeed require extensive – even global – networks of local healers, colonial merchants and doctors, on-the-spot draughtsmen and engravers back home, and ultimately wealthy collectors in their urban palaces and country houses, where once again gardeners had to be employed to keep the exotic plants alive. But is the requisite manpower, and associated financial investment, a fitting criterion for scientific importance? Does something become more scientific as more money, time and effort are spent on it?

If on the other hand we are talking about scientific breakthroughs, do not the physical and mathematical sciences have a far greater claim? Atomic theory, calculus and the concept of inertia are just three of the achievements of seventeenth-century natural philosophy, each of which was indispensable in its own way to the further development of science. Admittedly, these scientific breakthroughs had as yet little social significance and reached only a small audience, although the controversy surrounding Copernicus’s theory should not be forgotten or downplayed.¹³ The naturalistic, or in Cook’s terms

¹² It is conspicuous that Constantijn Huygens, who cannot make a claim to a single scientific achievement, is mentioned much more often in *Matters of Exchange* than his son Christiaan, whose versatile genius was unparalleled in the Republic.

materialistic, ideas about the structure of the world and about people's motives, which evolved out of the practice of empirical research into natural phenomena, were perhaps more readily absorbed into the world-view of the early – that is radical – Enlightenment. But the time of the mathematical description of nature was still to come, which means there is not a single reason to omit the physical and mathematical natural sciences from the story of 'the new science'.

This does not of course mean that I think back nostalgically to the time of Alexandre Koyré and E.J. Dijksterhuis. The history of science is no longer just the history of abstract ideas or world-views, nor is it taken for granted that the broad outline of early modern natural science was determined by astronomy and mechanics, with mathematics in a supporting role. It is beyond dispute that science can also be found in the alchemist's workshop, the urban doctor's herb garden and the wealthy merchant's cabinet of curiosities, just as it is obvious that disciplines such as medicine and natural history were given a tremendous boost as a result of the new fascination for sensory observation – wherever this fascination originated. Whenever someone points out to us just how much broader the domain of the sciences was than we have long believed, and how much more deeply the new science is rooted in the social relationships of the early modern period, we should be delighted. For this reason, despite all the questions it raises, the publication of Cook's book is an event of great significance. But we must not make the opposite mistake and pretend that the history of scientific innovation in the early modern period completely overlapped with the new preoccupation within natural history and medicine with collection and description, disregarding what happened in astronomy, mechanics and mathematics. These too were sciences linked in their own way to the society in which they flourished. These too were sciences that took advantage – sometimes in surprising ways – of the new preoccupation with sensory observation and new ways of picturing reality.

Klaas van Berkel (1953) is professor of history at the University of Groningen. This year he published the first volume of a history of the Royal Netherlands Academy of Arts and Sciences.

Summary

Klaas van Berkel, *Rediscovering Clusius. How Dutch Commerce contributed to the Emergence of Modern Science*

In his highly stimulating book *Matters of Exchange. Commerce, Medicine, and Science in the Dutch Golden Age*, Harold J. Cook argues that the intellectual activities we call science emerged from ways of knowing that were valued most highly by merchant-rulers. He demonstrates this thesis by describing and analyzing scientific developments in the Dutch Republic. However, both Cook's one-sided description of the new science and his idealized recon-

¹³ On this subject: R. Vermij, *The Calvinist Copernicans. The Reception of the New Astronomy in the Dutch Republic, 1575-1750* (Amsterdam 2002).

struction of the mentality of the merchant elite in the Dutch Republic weaken his case considerably. A more ecumenical view of early modern science and a more realistic picture of the values and the conduct of merchants in Europe are needed to bolster an argument that still looks very promising.

Samenvatting

Klaas van Berkel, *Rediscovering Clusius. How Dutch Commerce contributed to the Emergence of Modern Science*

In zijn zeer stimulerende boek *Matters of Exchange. Commerce, Medicine, and Science in the Dutch Golden Age* betoogt Harold Cook dat de intellectuele activiteiten die wij natuurwetenschap noemen ontstonden uit de manieren van kennisverwerving die vooral kooplieden in het vroegmoderne Europa op hoge prijs stelden. De bewijzen voor zijn stelling ontleent hij aan de geschiedenis van de natuurwetenschappen in de Republiek. Zijn beperkte opvatting van wat wetenschap is en zijn geidealiseerde voorstelling van de mentaliteit van de handelselite in de Republiek verzwakken zijn argumentatie echter aanzienlijk. Er is een bredere kijk op de vroegmoderne natuurwetenschap en een realistischer weergave van het waardenpatroon van de kooplieden nodig om de stelling – die zeer aantrekkelijk blijft – te ondersteunen.

Recensies

Jonge, W. de, Bazelmans, J., Jager, D. de (eds.), *Forum Hadriani. Van Romeinse stad tot monument* (Utrecht: Matrijs, 2006, 504 blz., €49,95, ISBN 90 5345 291 5).

Al in de zestiende eeuw werden er op het latere landgoed Arentsburg in Voorburg stenen altaren met Latijnse inscripties aangetroffen. Misschien vonden er nu en dan kleine opgravingen plaats, waarbij opnieuw Romeinse objecten werden opgedolven en bestond er mede daardoor het vermoeden dat hier iets groots te vinden zou zijn. Pas in 1827 begon de Leidse hoogleraar Caspar Reuvens grootschalige onderzoeken waarover hij rapporten publiceerde in de *Staatscourant* en schitterende dagboeken en tekeningen naliet (nu Rijksmuseum van Oudheden, Leiden). Zelf mocht ik die boeken begin jaren tachtig in het kader van een onderzoek naar Romeinse wandschilderingen bestuderen en ik las zijn precieze observaties met stijgende bewondering. Vervolgens kennen we een reeks opgravingscampagnes van de eveneens Leidse hoogleraar J. H. Holwerda tussen 1908 en 1913.

Het is een gelukkige zaak geweest dat in de late twintigste eeuw eindelijk de gelegenheid werd geschapen, mede op basis van jarenlange nauwkeurige observaties van amateur-archeologen, grootschalig veldonderzoek te verrichten. Reuvens was ervan uitgegaan dat de indrukwekkende resten van muurwerk (in Nederland een zeldzaamheid, omdat steen in de middeleeuwen en later werd uitgebroken en hergebruikt, zodat bij uitstek Romeinse plaatsen als Nijmegen en Maastricht nauwelijks monumentale antieke ruïnes hebben) behoorden tot een plaats die van de Tabula Peutingeriana bekend was onder de naam Forum Hadriani. Hieruit blijkt dat de genoemde keizer in de vroege tweede eeuw aan de nu Zuid-Hollandse kust een plaats nieuw heeft gesticht of, indien bestaand, omgedoopt en juridisch opgewaardeerd met bepaalde rechten. Reuvens had het bij het rechte eind en het is dan ook merkwaardig dat Holwerda deze interpretatie omverhaalde en, zonder goede aanwijzingen te hebben, een vlootbasis veronderstelde. Nu is het idee van een stadje algemeen aanvaard. In onze streken is dat overigens bijzonder, omdat de niet-Romeinen volstrekt niet in stedelijke nederzettingen leefden. Wat er aan steden was, was Romeins, te beginnen met het genoemde Nijmegen. Langs de noordgrens van het Romeinse Rijk, gevormd door de Rijn en eindigend bij Katwijk in de tweede eeuw, waren verder vooral militaire nederzettingen, bewaakt door Romeinen en uit personen uit andere streken samengestelde hulptroepen.

Uit het onderzoek blijkt dat al in de eerste eeuw na Christus een kleine nederzetting ter plaatse moet hebben bestaan, die mogelijk in verband met Hadrianus' activiteiten in het noordwesten van het Rijk (men denke ook aan de Muur van Hadrianus in Engeland) is uitgegroeid tot een handelscentrum. Vooral gedurende de tweede eeuw heeft het gefloreerd. Het was ingedeeld volgens een soort schaakbordpatroon, met regelmatig gevormde huizenblokken. De omvang en het aantal bewoners zijn onbekend. Het is vermoedelijk